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AS

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/347,583 06/30/99 NI

T LAM1P111/P05

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IM22/0424

EXAMINER

BROWN, C

ART UNIT

PAPER NUMBER

1765

DATE MAILED:

04/24/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action SummaryApplication No.
09/347,583

Applicant(s)

NI et al.Examiner
Charlotte BrownGroup Art Unit
1765☒ Responsive to communication(s) filed on Jun 30, 1999☐ This action is **FINAL**.☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claim☒ Claim(s) 1-22 is/are pending in the applicationOf the above, claim(s) 14-22 is/are withdrawn from consideration☐ Claim(s) _____ is/are allowed.☒ Claim(s) 1-13 is/are rejected.☐ Claim(s) _____ is/are objected to.☐ Claims _____ are subject to restriction or election requirement.**Application Papers**☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.☐ The drawing(s) filed on _____ is/are objected to by the Examiner.☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.☐ The specification is objected to by the Examiner.☐ The oath or declaration is objected to by the Examiner.**Priority under 35 U.S.C. § 119**☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).☐ All ☐ Some* ☒ None of the CERTIFIED copies of the priority documents have been☐ received.☐ received in Application No. (Series Code/Serial Number) _____☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).**Attachment(s)**☒ Notice of References Cited, PTO-892☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 4☐ Interview Summary, PTO-413☒ Notice of Draftsperson's Patent Drawing Review, PTO-948☐ Notice of Informal Patent Application, PTO-152**— SEE OFFICE ACTION ON THE FOLLOWING PAGES —**

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DETAILED ACTION

Election/Restriction

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-13, drawn to an apparatus, classified in class 156, subclass 345.
 - II. Claims 14-22, drawn to a method, classified in class 438, subclass 690.

2. The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the apparatus as claimed can be used to practice another and materially different process such as vapor phase etching.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

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4. During a telephone conversation with William Putt on April 18, 2000 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-13.

Affirmation of this election must be made by applicant in replying to this Office action. Claims 14-22 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(I).

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Singh (US 6,042,687) in view of Su (US 5,552,124).

From line 42 to the end of column 5, Singh discloses a plasma processing system and method for processing substrates such as by chemical vapor deposition or etching. The plasma

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processing system comprises a substrate support assembly and a processing chamber enclosing the substrate support. The substrate may be a semiconductor substrate having diameters such as 4", 6", 8", and 12", etc. The substrate support includes an electrostatic chuck for supporting the wafer and at least one electrode supplying an RF bias to the substrate. The substrate support assembly includes a gas ring at both ends of the substrate. Such rings are referred to as focus rings which balance the gas flow above the substrate. Focus rings are sometimes referred to as diffusion barriers because they inhibit diffusive transport of gaseous reactants and byproducts near the substrate perimeter. The diffusion barrier inhibits higher gas flow at the substrate edge to avoid non-uniform processing of the substrate. A substrate passivating gas is injected so as to be concentrated near the periphery of the substrate to achieve uniform etching or deposition on the substrate. Clearly, this reads on the limitation of a barrier having a first position wherein the first position relative to the wafer substantially facilitates etch uniformity for a chemically driven etch process and having a second position relative to the wafer wherein the second position relative to the wafer does not interfere with the etch uniformity of an ion driven etch process.

Unlike the instant invention, Singh does not disclose an apparatus which has a movable barrier wherein the first position is capable of restricting diffusion of gases over the wafer within the plasma processing apparatus to the wafer.

In column 4, Su discloses a movable focus ring, which acts as a diffusion barrier. The focus ring is used to shield the wafer during wafer processing in a plasma reactor. The focus ring includes a first slotted opening, where the two openings cooperate to provide a balanced gas

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flow distribution across the wafer surface, such that process uniformity is achieved across the wafer surface. The focus ring displaces chamber volume and thereby stabilizes gas flow within the chamber. The focus ring has a circular, an eccentric, or a baffle configuration to provide uniform gas flow distribution across the wafer surface. The wafer is supported by a wafer pedestal which is positioned over a cathode base. The wafer is shielded by a focus ring that rests on the pedestal and that surrounds the wafer.

It is the Examiner's position that a person having ordinary skill in the art would have found it obvious to modify Singh with the movable focus ring disclosed by Su since Singh also uses focus rings as diffusion barriers. This substitution of a movable focus ring in place of a stationary focus ring would have been anticipated to produce an expected result.

8. Any inquiry concerning this communication from the Examiner should be directed to Charlotte A. Brown whose telephone number is (703) 305-0727.

CAB

April 19, 2000


BENJAMIN L. UTECH
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